e) determining result conditions from the difference set, the result conditions meeting effecting the preventive maintenance

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REMARKS

I.   STATUS OF THE CLAIMS

Claims 1-11 are pending.

Claims 1 and 8-11 are amended.

Claim 3 is objected to as being dependent upon a rejected base claim, but allowable if rewritten in independent form.

II.   OBJECTION TO THE SPECIFICATION AND DRAWINGS

Page 2 of the Office Action objects to the drawings. The Specification is amended to overcome the objection.

Page 2 of the Office Action also objects to the Specification, and requires a substitute specification "in proper idiomatic English" in according with 37 C.F.R. 1.52(a) and (b). The Applicant respectfully submits two points.

First, 37 C.F.R. 1.52 (a) and (b) relate to the quality of the print of the application and its form (i.e. margins, paper size). Thus, it is not clear to the Applicant why the Specification as filed does not meet these requirements. If the Examiner wishes to maintain this rejection, please point out to the Applicant the deficiency in the form of the Specification so that the Applicant can correct same.

Second, if the rejection is based on the Examiner's position that the current Specification is contains improper grammar etc., the Applicant submits that after careful review of the Specification the quality of the Specification clearly satisfies the requirements of 37 C.F.R. 1.71. If the Examiner is of the position that the Specification is contains improper grammar and word usage, the Applicant respectfully requests the Examiner to point out same so that the Applicant may address these matters. However, once again the Applicant states that in Applicant's opinion, the Specification as filed is in proper form and the Applicant notes MPEP 608.01(g) which states, "but it must be remembered that an examination is not made for the purpose of securing grammatical perfection."

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Therefore, in view of the above, withdrawal of the objections is respectfully requested.

III.   CLAIMS 1, 2, 4, 5, 8-11 ARE REJECTED UNDER 35 U.S.C. § 102(e)

Page 3 of the Office Action rejects claims 1, 2, 4, 5, and 8-11 under 35 U.S.C. § 102(e) as being anticipated by Winkelmann, U.S. Patent No. 6,047,278 (Hereinafter "Winkelmann"). The rejections are traversed below.

Winkelmann relates to an automatic generation of a control algorithm for a process controller, i.e. for the automatic production of a safe control code for a controller. A non deterministic automaton is implemented, which describes the physically possible forms of behavior of the controller. Furthermore, all of the permitted state transitions of the process affected by the controller are defined. "Safe" in the context of Winkelmann refers to the concept that the process affected by the controller should assume only such states produced by the effect of the controllers which are also stable. Thus, all stable states of the process are determined (he largest subset that can be stabilized"). Then a transition function of the controller is defined which leads only to safe states of the process within the "subset." The automaton is arranged corresponding to this "safe" transition function. A controller is iteratively designed in Winkelmann so that it controls a process only within a "safe" i.e. stable, state region.

Claim 1 recites, "A method for computer-supported error analysis of at least one of **sensors and actuators in a technical system**, the error analysis being in a form of a status-finite description that exhibits statuses of technical system, the method using a computer, comprising a) determining a status-finite description of **the technical system** for an error case of **an error of at least one of a sensor and an actuator in the technical system**;" (emphasis added).

Sensors and actuators are in the "technical system" recited in the claim. Winkelmann does not relate to sensors and actuators. Winkelmann only relates to theoretical states, and a set of safe states. Further, Winkelmann does not relate to errors of sensors or actuators.

Claim 1 also recites, "d) forming a difference set from the first set and the second set; and e) determining result conditions from the difference set, the result conditions meeting prescribable conditions."

The Office Action cites Winkelmann, column 8, line 18 to column 9, line 54, as disclosing these features." The cited portion of Winkelmann relates to methods for function generation

and describes an algorithm for generating states that result in a stable system. The algorithm described operates by iteratively setting possible states to achieve at optimal results. However, the algorithm does not mention forming a **difference set**. Notice that the difference operator is not even used in <u>Winkelmann</u>. Thus, <u>Winkelmann</u> generates sets in different manner than as claimed. If the Examiner wishes to maintain the rejection the Applicant respectfully requests that he point out with particularity which line of the large cited portion (column 8, line 18 to column 9, line 54) discloses forming a difference set from a first set and a second set, as claimed. Further, the resulting set in <u>Winkelmann</u> is not determined from a difference set.

Therefore, in view of the above, the applicant submits that claim 1 is not anticipated by <u>Winkelmann</u>. The remaining independent claims (8-11), in view of the above, are also not anticipated by <u>Winkelmann</u>.

Therefore, in view of the above, withdrawal of the rejections is respectfully requested.

IV.   REJECTION OF CLAIMS 6 AND 7 UNDER 35 U.S.C. § 103

Claims 6 and 7 are dependent upon claim 1, which for the above reasons, should be allowed over the applied art. Therefore, withdrawal of the rejections is respectfully requested.

V.   CONCLUSION

There being no further outstanding objections or rejections, it is submitted that the application is in condition for allowance. An early action to that effect is courteously solicited.

Finally, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to these matters.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

STAAS & HALSEY LLP

Date: 10/23 02

By: _____
Jon H. Muskin
Registration No. 43,824

700 Eleventh Street, NW, Suite 500
Washington, D.C. 20001
(202) 434-1500

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE SPECIFICATION:

Please AMEND the paragraph beginning at page 9, line 14, as follows:

The fabrication cell FZ comprises a delivering conveyor belt FB at whose end a lift-off turntable picks up workpieces [WS] and supplies them to a robot R. The robot R places the workpiece [WS] into a press PR and places it – after being shaped – onto an outgoing belt WB. The fabrication cell FZ contains corresponding sensors X and actuators Y.

IN THE CLAIMS:

Please AMEND the following claims (all of the claims are listed below, whether or not amended):

1.   (ONCE AMENDED) A method for computer-supported error analysis of at least one of sensors and actuators in a technical system, the error analysis being in a form of a status-finite description that exhibits statuses of technical system, the method using a computer, comprising [the steps of]:

a) determining a status-finite description of the technical system for an error case of an error of at least one of a sensor and an actuator in the technical system;

b) determining a first set of achievable statuses for the technical system;

c) determining a second set of achievable statuses for the technical system having an error;

d) forming a difference set from the first set and the second set; and

e) determining result conditions from the difference set, the result conditions meeting prescribable conditions.

2.   (AS ONCE AMENDED) The method according to claim 1, wherein method steps a) through f) are implemented for all possible errors of sensors and/or actuators is the technical system.

3.   (AS ONCE AMENDED) The method according to claim 1, wherein failure probabilities are allocated to the sensors and/or actuators; and wherein the error analysis ensues taking the failure probabilities into consideration.

4.   (AS ONCE AMENDED) The method according to claim 1, wherein method steps b)and c) ensue according to a method of model checking.

5.   (AS ONCE AMENDED) The method according to claim 1, wherein a status-finite description of a process implemented by the technical system is included in the method.

6.   (AS ONCE AMENDED) The method according to claim 1, wherein the status-finite description is realized by a finite automat.

7.   (AS ONCE AMENDED) The method according to claim 6, wherein the status-finite is realized by a finite automat in a form of a binary decision diagram.

8.   (ONCE AMENDED) A method for rapid prototyping of a technical system, the system having at least one of sensors and actuators in a technical system, the prototyping being in a form of a status-finite description that exhibits statuses of the technical system, the method using a computer, comprising [the steps of]:
    a) determining a status-finite description of the technical system for an error case of an error of at least one of a sensor and an actuator in the technical system;
    b) determining a first set of achievable statuses for the technical system;
    c) determining a second set of achievable statuses for the technical system having an error;
    d) forming a difference set from the first set and the second set; and
    e) determining result conditions from the difference set, the result conditions effecting prototyping of the technical system.

9.   (ONCE AMENDED) The method error diagnosis of a technical system, the system having at least one of sensors and actuators in a technical system, the error diagnosis being in a form of a status-finite description that exhibits statuses of the technical system, the method using a computer, comprising [the steps of]:
    a) determining a status-finite description of the technical system for an error case of an error of at least one of a sensor and an actuator in the technical system;
    b) determining a first set of achievable statuses for the technical system;

c) determining a second set of achievable statuses for the technical system having an error;

d) forming a difference set from the first set and the second set; and

e) determining result conditions from the difference set, the result conditions effecting error diagnosis of the technical system.

10.   (ONCE AMENDED) A method for generating critical test cases for a commissioning and a system test of a technical system, the system having at least one of sensors and actuators in a technical system, the generating being in a form of a status-finite description that exhibits statuses of the technical system, the method using a computer, comprising [the steps of]:

a) determining a status-finite description of the technical system for an error case of an error of at least one of a sensor and an actuator in the technical system;

b) determining a first set of achievable statuses for the technical system;

c) determining a second set of achievable statuses for the technical system having an error;

d) forming a difference set from the first set and the second set; and

e) determining result conditions from the difference set, the result conditions effecting the generation of critical test cases.

11.   (ONCE AMENDED) A method for preventive maintenance of a technical system, the system having at least one of sensors and actuators in a technical system, the method being in a form of a status-finite description that exhibits statuses of the technical system, the method using a computer, comprising [the steps of]:

a) determining a status-finite description of the technical system for an error case of an error of at least one of a sensor and an actuator in the technical system;

b) determining a first set of achievable statuses for the technical system;

c) determining a second set of achievable statuses for the technical system having an error;

d) forming a difference set from the first set and the second set; and

e) determining result conditions from the difference set, the result conditions meeting effecting the preventive maintenance.